

Syllabus

Course Number: ISE230

National College

Revised 11-27-12

ISE230: Linux Administration

Credit Hours: 4

Prerequisites: ISE205

Course Description

This course provides students with the conceptual knowledge and hands-on skills necessary to work with Linux operating systems in a network administration environment. The course covers the latest Linux distributions, as well as new storage technologies such as LVM and ext4. Students will also learn about key job-related networking services including FTP, NFS, Samba, Apache, DNS, DHCP, NTP, RADIUS, LDAP, Squid, Sendmail Postfix, X, SSH, VNC, and SQL. Security practices and technologies will also be covered. The course is designed to prepare students to sit for CompTIA's Linux+ (Powered by LPI) Certification examination.

Instructor Contact Information

Instructor Name	Gerard Arthus
Instructor Email	Garthus801@gmail.com
Instructor Phone	Home: 574 217 8726 Cell: 631 335 5250

Course Length

The college evaluates each course in terms of quarter hours of credit. One unit of credit is usually equivalent to a minimum of ten academic instruction hours of lecture and examination, twenty hours of skill development, or thirty hours of externship, or a combination of the three. An academic instructional hour is fifty minutes.

This class will meet for the equivalent of a minimum of 55 instructional hours or as otherwise scheduled by the college and at least in conformance with this minimum and the Syllabus. As specified by the Method of Instruction section of this Outline, the instructor will ensure that the total class sessions presented consist of a minimum of 27.5 direct faculty instruction hours and a maximum of 27.5 appropriate classroom activity hours.

All course offerings require outside preparation time, which is approximately two hours per lecture instructional hour and/or one hour per skill development instructional hour, depending on the background, interest, abilities, and motivation of the individual student.

Course Objectives

By the end of this course, you should be able to:

1. Prepare for and complete a Linux installation.
2. Troubleshoot the Linux installation process.
3. Access and restore an installed system using System Rescue.
4. Understand, manage and administer a Linux Filesystem.
5. Understand the purpose and use of the BASH shell and identify and manipulate common shell environment variables. Create and export new shell variables.
6. Describe the purpose and nature of shell scripts and create and execute basic shell scripts.
7. Understand and effectively use common decision constructs in shell scripts
8. Use the BASH shell to redirect the input and output of a command.
9. Configure the GRUB and LILO boot loaders.
10. Explain how the init daemon initializes the system at boot time into different runlevels. and configure a system to start daemons upon entering certain runlevels.
11. Explain the purpose of the major Linux GUI components: X Windows, window manager and desktop environment.
12. Configure X Windows settings.

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13. Categorize the different types of processes on a Linux system, view processes using standard Linux utilities, and manage processes on a running system.
14. Schedule commands to execute in the future using the *at* daemon and to execute repetitively using the *cron* daemon.
15. Set up, manage and administer printers on a Linux system.
16. Create, modify, manage and delete user and group accounts.
17. Performs system backups using *tar*, *cpio*, and *dump* commands and view and extract archives using the *tar*, *cpio* and *restore* commands.
18. Compile and install software packages from source code.
19. Use the Red Hat Package Manager to install, manage and remove software packages.
20. Use the *yum* commands to obtain software from Internet software repositories.
21. Configure a network interface to use TCP/IP. Configure modems, ISDN and DSL interfaces.
22. Use command line and graphical utilities to perform remote system administration.
23. Configure infrastructure network services including DHCP, DNS, NTP and NIS.
24. Configure Web services using the Apache Web server.
25. Configure file sharing services including Samba, NFS, and FTP.
26. Configure e-mail services including Sendmail and Postfix.
27. Configure database services using PostgreSQL.
28. Describe the different facets of Linux security.
29. Increase the security of a Linux system.
30. Outline measures and utilities that can be used to detect a Linux security breach.

Gradebook

A student's performance in this course will be evaluated using a variety of factors listed below. Instructors must use a minimum of three (**homework, tests and a final exam are required**), and it is recommended that instructors use all five of the areas in your evaluation.

The exact weight to be given to any particular area is determined by the instructor and will normally fall within the ranges listed below.

Area	Percentage for this Course	Suggested Range
Final Exam	25%	20 – 25%
Tests	30%	20 – 40%
Homework	15%	10 – 15%
Project/Research Paper	20%	20 – 25%
Class Participation	10%	10 – 15%
TOTAL	100%	

Letter Grade	Points	Explanation
A	94-100	Excellent
B	84-93	Above Average
C	74-83	Average

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D	64-73	Below Average
F	63 & Below	Failure

Textbook & Instructional Material

Eckert, Jason. Linux+ Guide to Linux Certification, 3rd ed. w/CourseMate. Course Technology – Cengage Learning.

LabSim for Linux+ (LXO101 and LXO102), TestOut Corporation

The instructor might utilize additional instructional materials as provided by the publisher.

Course Outline

Term: 133

Class Date: <u>Week 1 - 20 February 2013</u> Chapter 1: <i>Introduction to Linux</i>	Homework Due Date: <u>The end of the term</u>
In Class Activities <u>Install CENTOS, a LINUX Enterprise Operating System based upon Fedora LINUX, in a Virtual Machine on your Windows 7 Desktop.</u> <u>Install VMWare WorkStation 9.0 on the Windows 7 Workstation.</u> <u>Do the first 10 review questions at the end of this chapter and email them to the instructor.</u>	Homework <u>Post a reply to the discussion forum located on the web-assist site for this week.</u> <u>Complete all of the readings for this week posted on the web-assist site.</u> <u>Review the Videos and tutorials posted on the web-assist site for this week</u> <u>Complete the homework lab (take screenshots of all work and exercises) assigned for this week</u>
Class Date: <u>Week 1 - 20 February 2013</u> Chapter 2: <i>Linux Installation and Usage</i>	Homework Due Date: <u>The end of the term</u>
In Class Activities <u>Install CENTOS, a LINUX Enterprise Operating System based upon Fedora LINUX, in a Virtual Machine on your Windows 7 Desktop.</u> <u>Install VMWare WorkStation 9.0 on the Windows 7 Workstation.</u> <u>Do the first 10 review questions at the end of this chapter and email them to the instructor.</u>	Homework <u>Post a reply to the discussion forum located on the web-assist site for this week.</u> <u>Complete all of the readings for this week posted on the web-assist site.</u> <u>Review the Videos and tutorials posted on the web-assist site for this week</u> <u>Complete the homework lab (take screenshots of all work and exercises) assigned for this week</u>

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Class Date: <u>Week 2 - 27 February 2013</u> Chapter 3: <i>Exploring Linux Filesystems</i>	Homework Due Date: <u>The end of the term</u>
In Class Activities <u>Install and configure Webmin on the Windows 7 Workstation</u> <u>Do the first 10 review questions at the end of this chapter and email them to the instructor.</u>	Homework <u>Post a reply to the discussion forum located on the web-assist site for this week.</u> <u>Complete all of the readings for this week posted on the web-assist site.</u> <u>Review the Videos and tutorials posted on the web-assist site for this week</u> <u>Complete the homework lab (take screenshots of all work and exercises) assigned for this week</u>
Class Date: <u>Week 2 - 27 February 2013</u> Chapter 4: <i>Linux Filesystem Management</i>	Homework Due Date: <u>The end of the term</u>
In Class Activities <u>Install and configure Webmin on the Windows 7 Workstation</u> <u>Do the first 10 review questions at the end of this chapter and email them to the instructor.</u>	Homework <u>Post a reply to the discussion forum located on the web-assist site for this week.</u> <u>Complete all of the readings for this week posted on the web-assist site.</u> <u>Review the Videos and tutorials posted on the web-assist site for this week</u> <u>Complete the homework lab (take screenshots of all work and exercises) assigned for this week</u>

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Class Date: <u>Week 3 – 06 March 2013</u> Chapter 5: <i>Linux Filesystem Administration</i>	Homework Due Date: <u>The end of the term</u>
In Class Activities	Homework
<p><u>Configure a web-server with Webmin.</u></p> <p><u>Do the first 10 review questions at the end of this chapter and email them to the instructor.</u></p>	<p><u>Post a reply to the discussion forum located on the web-assist site for this week.</u></p> <p><u>Complete all of the readings for this week posted on the web-assist site.</u></p> <p><u>Review the Videos and tutorials posted on the web-assist site for this week</u></p> <p><u>Complete the homework lab (take screenshots of all work and exercises) assigned for this week</u></p>
Class Date: <u>Week 3 – 06 March 2013</u> Chapter 6: <i>Advanced Installation</i>	Homework Due Date: <u>The end of the term</u>
In Class Activities	Homework
<p><u>Configure a web-server with Webmin.</u></p> <p><u>Do the first 10 review questions at the end of this chapter and email them to the instructor.</u></p>	<p><u>Post a reply to the discussion forum located on the web-assist site for this week.</u></p> <p><u>Complete all of the readings for this week posted on the web-assist site.</u></p> <p><u>Review the Videos and tutorials posted on the web-assist site for this week</u></p> <p><u>Complete the homework lab (take screenshots of all work and exercises) assigned for this week</u></p>

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Class Date: <u>Week 4 – 13 March 2013</u> Chapter 7: <i>Working with the BASH Shell</i>	Homework Due Date: <u>The end of the term</u>
In Class Activities <u>Configure a firewall with Webmin.</u> <u>Do the first 10 review questions at the end of this chapter and email them to the instructor.</u>	Homework <u>Post a reply to the discussion forum located on the web-assist site for this week.</u> <u>Complete all of the readings for this week posted on the web-assist site.</u> <u>Review the Videos and tutorials posted on the web-assist site for this week</u> <u>Complete the homework lab (take screenshots of all work and exercises) assigned for this week</u>
Class Date: <u>Week 4 – 13 March 2013</u> Chapter 8: <i>System Initialization and X Windows</i>	Homework Due Date: <u>The end of the term</u>
In Class Activities <u>Configure a firewall with Webmin.</u> <u>Do the first 10 review questions at the end of this chapter and email them to the instructor.</u>	Homework <u>Post a reply to the discussion forum located on the web-assist site for this week.</u> <u>Complete all of the readings for this week posted on the web-assist site.</u> <u>Review the Videos and tutorials posted on the web-assist site for this week</u> <u>Complete the homework lab (take screenshots of all work and exercises) assigned for this week</u>

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Class Date: <u>Week 5 – 20 March 2013</u> Chapter 9: <i>Managing Linux Processes</i>	Homework Due Date: <u>The end of the term</u>
In Class Activities <u>Configure uploading and downloading files with Webmin.</u> <u>Do the first 10 review questions at the end of this chapter and email them to the instructor.</u>	Homework <u>Post a reply to the discussion forum located on the web-assist site for this week.</u> <u>Complete all of the readings for this week posted on the web-assist site.</u> <u>Review the Videos and tutorials posted on the web-assist site for this week</u> <u>Complete the homework lab (take screenshots of all work and exercises) assigned for this week</u>
Class Date: <u>Week 5 – 20 March 2013</u> Chapter 10: <i>Common Administrative Tasks</i>	Homework Due Date: <u>The end of the term</u>
In Class Activities <u>Configure uploading and downloading files with Webmin.</u> <u>Do the first 10 review questions at the end of this chapter and email them to the instructor.</u>	Homework <u>Post a reply to the discussion forum located on the web-assist site for this week.</u> <u>Complete all of the readings for this week posted on the web-assist site.</u> <u>Review the Videos and tutorials posted on the web-assist site for this week</u> <u>Complete the homework lab (take screenshots of all work and exercises) assigned for this week</u>
Class Date: <u>Week 6 – 27 March 2013</u>	Homework Due Date: <u>The end of the term</u>

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Chapter 11: <i>Compression, System Backup and Software Installation</i>	
In Class Activities	Homework
<p><u>Configure Command Shell with Webmin.</u></p> <p><u>Do the first 10 review questions at the end of this chapter and email them to the instructor.</u></p>	<p><u>Post a reply to the discussion forum located on the web-assist site for this week.</u></p> <p><u>Complete all of the readings for this week posted on the web-assist site.</u></p> <p><u>Review the Videos and tutorials posted on the web-assist site for this week</u></p> <p><u>Complete the homework lab (take screenshots of all work and exercises) assigned for this week</u></p>
Class Date: <u>Week 7 – 03 April 2013</u>	Homework Due Date: <u>The end of the term</u>
Chapter 12: <i>Network Configuration</i>	
In Class Activities	Homework
<p><u>Configure Bootup and Shutdown of Server with Webmin.</u></p> <p><u>Do the first 10 review questions at the end of this chapter and email them to the instructor.</u></p>	<p><u>Post a reply to the discussion forum located on the web-assist site for this week.</u></p> <p><u>Complete all of the readings for this week posted on the web-assist site.</u></p> <p><u>Review the Videos and tutorials posted on the web-assist site for this week</u></p> <p><u>Complete the homework lab (take screenshots of all work and exercises) assigned for this week</u></p>
Class Date: <u>Week 8 – 10 April 2013</u>	Homework Due Date: <u>The end of the term</u>
Chapter 13: <i>Configuring Network Services</i>	
In Class Activities	Homework

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<p><u>Configure DHCP Server with Webmin.</u></p> <p><u>Do the first 10 review questions at the end of this chapter and email them to the instructor.</u></p>	<p><u>Post a reply to the discussion forum located on the web-assist site for this week.</u></p> <p><u>Complete all of the readings for this week posted on the web-assist site.</u></p> <p><u>Review the Videos and tutorials posted on the web-assist site for this week</u></p> <p><u>Complete the homework lab (take screenshots of all work and exercises) assigned for this week</u></p>
<p>Class Date: <u>Week 9 – 17 April 2013</u></p> <p>Chapter 14: <i>Troubleshooting, Performance and Security</i></p>	<p>Homework Due Date: <u>The end of the term</u></p>
<p>In Class Activities</p> <p><u>Configure Bind DNS Server with Webmin.</u></p> <p><u>Do the first 10 review questions at the end of this chapter and email them to the instructor.</u></p>	<p>Homework</p> <p><u>Post a reply to the discussion forum located on the web-assist site for this week.</u></p> <p><u>Complete all of the readings for this week posted on the web-assist site.</u></p> <p><u>Review the Videos and tutorials posted on the web-assist site for this week</u></p> <p><u>Complete the homework lab (take screenshots of all work and exercises) assigned for this week</u></p>

This course has an in-class final exam. Final exam date: 24 April 2013

Additional Final Exam Information: The final exam and final project will be posted during week 8.

Method of Instruction

Instructional techniques must be appropriate, and at a collegiate level, to the specific goals and objectives cited above. Students and instructors must have a clear understanding of the goals and time requirements of this course, the nature of the course context, and method of evaluation.

This course has two distinct but related instructional phases. The first component constitutes a minimum of 27.5 direct faculty instruction hours. This component is the lecture series and provides instruction in theory, principles or practices of the course. The second component constitutes a maximum of 27.5 appropriate classroom activity hours. This component is the skill development phase of the course and provides students the opportunity to apply knowledge gained in the lecture series. Method of instruction must fulfill the intended learner outcomes and competencies stated in the course goals and objectives and are appropriate to the capabilities of the students. For career oriented courses, the instructor must demonstrate that an effective relationship exists between curricular content and current practices in the field.

Additional Class Notes

Go to <http://www.openeducation.org/moodle> to use the web-assisted site for this course. Quizzes and discussion forums will be completed on-line at this site; and all other assignments will be uploaded there. If you have any questions please contact the instructor. Doing the labs and exercises for this course will require using a screenshot program such as Greenshot; ask for information concerning how to install and use this program.